Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI (NEW) EXAMINATION – WINTER 2023

Subject Code:3160513 Date:07-12-2023

Subject Name: Waste Water Engineering

Time:02:30 PM TO 05:00 PM Total Marks:70

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Simple and non-programmable scientific calculators are allowed.**

			MARKS
Q.1	**(a)**	Sketch the wastewater treatment flow diagram for the sugar industry.	**03**
	(b)	Select and explain any primary treatment process for wastewater treatment.	**04**
	(c)	Explain vermiculture and root zone wastewater treatment process.	**07**
Q.2	**(a)**	List all parameters which can affect the anaerobic wastewater treatment process.	**03**
	(b)	Differentiate between aerated lagoons and activated sludge treatment process.	**04**
	(c)	Design a process flow sheet of wastewater treatment for steel industries.	**07**
		OR	
	(c)	Discuss in detail the wastewater characteristics.	**07**
Q.3	**(a)**	Explain the extended aeration wastewater treatment method.	**03**
	(b)	Explain expanded bed reactors for anaerobic wastewater treatment.	**04**
	(c)	Demonstrate and explain wastewater treatment flow diagram for the pulp and paper industry.	**07**
		OR	
Q.3	**(a)**	List all physical treatments involved in physicochemical treatment.	**03**
	(b)	How pH can affect the anaerobic wastewater treatment process?	**04**
	(c)	Demonstrate and explain the wastewater treatment scheme for the dyes industries.	**07**
Q.4	**(a)**	Explain various sources of wastewater.	**03**
	(b)	Explain stabilizing ponds for aerobic wastewater treatment.	**04**
	(c)	Use recent technologies to explain in detail the need for wastewater treatment.	**07**
		OR	
Q.4	**(a)**	Which are the challenges faced to treat wastewater treatment?	**03**
	(b)	Explain the process steps of trickling filters.	**04**
	(c)	Interpret and explain the term “reuse and reclamation of treated wastewater”.	**07**
Q.5	**(a)**	List anaerobic treatment technologies.	**03**
	(b)	Explain proportioning processes.	**04**
	(c)	Explain a sequential batch reactor for aerobic wastewater treatment.	**07**
		OR	
Q.5	**(a)**	Explain the principle of the anaerobic treatment process.	**03**
	(b)	Why sampling of wastewater is important?	**04**
	(c)	Explain a rotating biological contactor for aerobic wastewater treatment.	**07**

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